The MAC Flyer

FEBRUARY 1972

SPECIAL AIRCRAFT LANDING ISSUE

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The MAC Flyer

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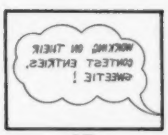
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ON THE COVER: A C-141 is only seconds away from the final fifty feet and the beginning of the landing problem.

(Photograph by Lt Col William H. Quelch, Jr.)

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Squawk Box

Here we are again friends, with another folksy, down-home column from the editor. Our subject: Writing. Last month we asked for cards and letters, and already the trickle is picking up. In fact, the word must be getting around by other means, 'cause our late-fall mail contained several items we could use (an example is on page 29). Thanks — and keep writing.

Other writing: Last year we received more than a dozen volunteer manuscripts and most of them were useable. At the end of the year, we looked back at those we'd published and decided to hold an Editor's Choice competition. We considered such things as message, organization, editing needed, and other highly subjective factors, and picked the 1971 article we liked best. "Education Eastbound," which appeared in our December issue, was the winner. Our congratulations — and a pen set — go to the author, Maj Arthur Covello, 903 MAGp (Res), McGuire.

This month's writing: Glance left at the lineup. We're focusing on landing — three major articles look at getting the bird safely on the ground. Three others relate to the theme: the contest winner, the civil flying tale, and even old C. R. Terror.

Note, please, an unusual feature: *Speak Up.* This involves writing by *you.* The instructions are on page 14, and the four forms make up our removeable center spread. All you need is something to cut with, write with, and think with. Our goal is 1,000 responses. If you and three friends (wives included) put in your two cents worth and *Speak Up,* we'll only have 996 to go. Or 992, or 988, or . . .

Write.

The difference between a touchdown and an impact is often determined by the degree of finesse displayed during . . .

The Final Fifty Feet

AFTER A RASH of hard landing incidents and accidents, the flight development section of a large commercial air carrier conducted an in-depth study of the landing problem. Using flight recorder data, including read-outs of aircraft pitch attitude, airspeed, and load factor, they analyzed hundreds of landings both good and bad. In this discussion, based on their findings, we can offer you few surprises. However, we can give you a detailed look at the mechanics of the final few seconds of flight based on factual data never before available.

The Flare

During an approach to landing, with no wind and at constant thrust, an aircraft is in equilibrium and the rate of descent is constant. At about 50 feet of altitude, the flare begins and the aircraft's rate of descent is gradually reduced toward zero. During this maneuver, even if thrust is maintained, the airspeed will begin to decrease. Eventually the airspeed will drop so low that, even with the increased angle of attack, the wings can no longer generate enough lift to support the aircraft. Hopefully, by this time the aircraft's wheels are only inches from the runway and a smooth landing results. Usually, thrust is also reduced during the flare which contributes to the rate of airspeed decay and moves the touchdown point closer to the approach end of the runway.

All the factors in this problem could be stated in an equation and solved mathematically. But a pilot must come up with the right answer in a short period of time — without being aware of the numerical quantities for most of the forces involved. He can help himself by keeping the equation as simple as possible.

In the basic flare problem there are four variables which the pilot can control: thrust, angle of approach, airspeed, and attitude. These four become hopelessly intermingled unless we remove one of the controlled items. For sake of discussion, it is most convenient to eliminate thrust because if the airspeed, attitude, and angle of approach are correct, thrust must be right. (It could

be argued that if the pilot has the correct attitude and airspeed, his ultimate control input is thrust alone. That is true, but our basis of discussion is still valid.) Absolute control of angle of approach, airspeed, and attitude produces good landings. Closing the loop of control depends on thrust. The interrelationship between the first three prerequisites for good landing and the final requirement — thrust — is the reason pilots are pilots.

Excluding thrust from our discussion doesn't diminish its importance but does make it easier to examine the other parameters. If we recognize that thrust is the ultimate tool to make the other factors exact, we can examine each of them in detail. We will also assume that the altitude is correct and the aircraft has arrived over the threshold at approximately 50 feet.

Airspeed

If the pilot maintains constant thrust as the flare begins, the airspeed will decrease. If the airspeed is steady immediately before the flare begins, the rate of airspeed decay is predictable. If, as usually happens, thrust is reduced during the flare, the airspeed decay is more rapid but is still predictable by the pilot.

However, if the airspeed is already falling when the flare begins, the rate of airspeed decay is anybody's guess, but it will be high — perhaps very high. A good rule which will almost guarantee a hard landing is to cross the runway threshold with the airspeed falling.

To avoid a hard landing, airspeed must be held as nearly constant as possible during the last part of the approach just before the flare is begun.

Attitude

Under normal conditions, the attitude of any particular aircraft descending on a three-degree glide slope is a fixed number of degrees nose down, which can be read directly off the attitude indicator. Pilots should know the pitch picture for their type aircraft, and if you don't have it pinned down to within a half a degree, you might want to pay a little more attention to the attitude indicator during your next coupled ILS approach. Once you know the number of degrees, and have the attitude indicator picture firmly in mind, you'll find it very useful during manual approaches. When properly set up, the aircraft will stick to the glide slope in an almost uncanny way.

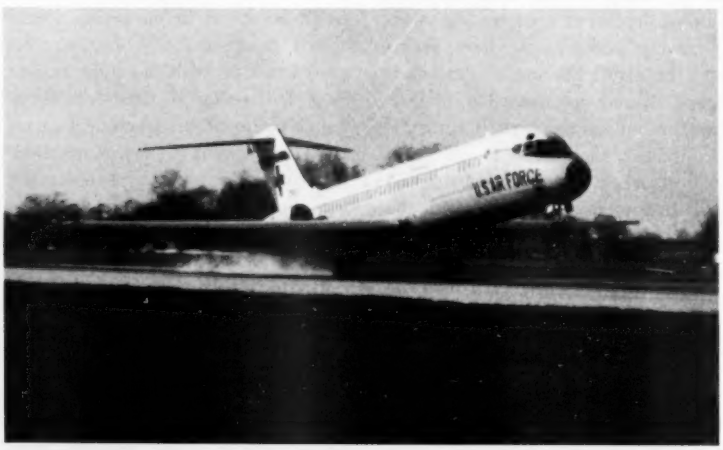
Attitude is important because any changes produce not only changes in lift but even larger changes in drag. If you agree that the fewer variables we introduce during the approach the easier the flare problem will be (and we sincerely hope you're convinced by now), then a constant, or nearly constant, attitude is a very great help.

The Angle of Approach

Pilots tend to use glide slope information if it's available; when there is none they generally fly a glide slope of approximately three degrees. Sometimes local conditions can lure a pilot into falsely judging his approach angle. For example, if the runway is short — or looks short — the pilot may wind up with a flatter than normal approach. We've learned that it's extremely difficult to make consistently good landings from flat approaches. The aircraft is in a nose high attitude at the beginning of the flare, and when the nose comes up even farther, a very high rate of descent can quickly develop. In a situation like this a firm landing is almost sure.

The Perfect Flare

If the aircraft arrives at the start-flare point with the correct airspeed, attitude, and angle of approach, the perfect flare is possible. The pilot smoothly increases the pitch attitude



DRIVING THE WHEELS INTO THE RUNWAY, by increasing pitch attitude at the moment of touchdown, is a common cause of hard landings.

and reduces thrust. Rate of descent and airspeed slowly decrease as the aircraft slowly nears the ground. In ground effect, just before touchdown, the aircraft pitches forward very slightly and — if the elevator is held constant — the aircraft will nose over almost imperceptibly to the perfect touchdown. This slight nose down pitch has been found when analyzing all the very best landings. The entire flare maneuver is smooth and unhurried as the aircraft is rotated to the landing attitude.

The Imperfect Flare

A flare that fails to raise the nose of the aircraft enough, or a flare started too close to the ground, can produce a hard landing — a case of too-little, or too-little-too-late, or a combination of both. Landings of this type will be firm, but seldom hard enough to damage the aircraft. The type of hard landings that do cause damage result from a "snatched" flare, or what could be described as too-much-too-late. In this maneuver, the aircraft is rotated rapidly and if it touches down during the rotation, it will probably hit hard enough to be bent.

When a pilot suddenly realizes that he's closing with the ground more quickly than he thought he was, it's instinctive to pull back on the control column. He doesn't really have time to work out the details of what he's attempting to do, but his idea is to increase angle of attack to increase lift and slow the rate of descent. Unfortunately, when he applies up elevator, the first thing that happens is that the tail goes down — actually increasing the rate of descent momentarily. It's difficult to compute actual figures for this effect, but the time between the control input and the desired result is on the order of one second. This would vary of course in different aircraft types.

THE FIRST STEP toward a smooth landing is a stable final approach.

This maneuver is sometimes described as "driving the wheels into the ground." Although not a strictly accurate description of what happens, this is pretty close and probably worth accepting as true.

Unfortunately, things can — and sometimes do — get even worse. Since the aircraft's center of gravity is forward of the main landing gear, there is a natural tendency for the nose to come down after main gear touchdown. If the main landing gear hits hard, as it has in the situation we've just described, the normal nose down tendency is reenforced and the nose gear literally slams onto the runway. The pilot, realizing he's got a hard landing on his hands, releases the back pressure on the control column. This action reduces the load factor on the horizontal stabilizer which causes the nose to come down even more sharply.

If it's really going badly, about this time the aircraft bounces back into the air, in a nose low attitude, and is located several feet above the runway, with little airspeed left while the pilot is actually applying *down* elevator! The second touchdown, in a situation like this, is often disastrous.

Conclusions

We can summarize all this information in these rules for good landings:

- Maintain constant airspeed during the last part of the final approach just before beginning the flare.
- Maintain a constant pitch attitude on final approach until beginning the flare.
- Fly a normal three-degree glide slope.
- Start a smooth rotation to the landing attitude at an altitude of approximately 50 feet.

"But I know all that," you might be saying to yourself, and we agree. Nevertheless, we'll wager that the next time you unexpectedly "arrive" on the runway, you'll have a better understanding of what went wrong. Better yet, if you'll apply this knowledge — on every landing — we will have eliminated the hard landing problem.

The aircraft was in good shape. The weather was all right. The approach aids were all working. But there was a slight problem:

Crew

A RECENT ACCIDENT in a twin-engine aircraft exhibited some rather drastic pilot-copilot procedures. Every pilot familiar with multi-crew operations knows the value of teamwork in the cockpit and the requirement for a pilot-in-command. In considering the following, the moral is obvious and needs no spelling out. However, the point is clear — the crew should have established the necessary pilot-copilot relationship prior to the latter phase of an instrument letdown . . .

* * *

At 1415 hours a twin turboprop plane landed 800 feet short and 300 feet left of the runway centerline, with sufficient impact to shear off the nose wheel, and bend the nose wheel fork and two propellers. Fortunately for the crew, the only two on board, there was no fire. An investigation into the mishap disclosed a sequence of events reminiscent of the old "Who's on first and what's on second" routine. But it easily could have been more tragedy than comedy.

The pilots' statements, herein offered, indicate much less than a coordinated team of professionals at work in the cockpit.

Statement #1

"The command pilot filed an instrument flight plan with ATC. Destination was forecast at 800 and one. The flight at 12,000 feet was uneventful, except for light to moderate turbulence as letdown was commenced. The ATR-rated command pilot was occupying the right seat and the copilot with a commercial rating was occupying the left seat and was to make the approach and landing.

"As approach was initiated, destination was giving a 300 ft. ceiling and visibility variable between one-half and one mile. The aircraft was vectored by approach control to a point outside the compass locator for a back course runway 10 approach. The copilot began the descent from 2,000 ft. at the compass locator to cross the listed intersection at 1,600 ft. He crossed the intersection at 1,500 ft., continuing descent at a rate of 1,000 fpm to the legal minimum of 740 ft. for this particular approach. When the copilot continued descent to 500 ft. MSL, the command pilot cautioned him that he was 250 ft. below minimum and to pull up to 740 ft. as the aircraft was still three miles from threshold.

"The copilot then claimed he had the runway in sight. He closed the power levers, and shoved forward on the control yoke. The pilot told him to go back on instruments and regain legal altitude. Instead, the copilot was staring out the left window and repeating over and over, 'I have the runway!' The pilot then grasped the controls and said, 'I've got it.' He opened the throttles and attempted to pull back on the control column, but the copilot reclosed the throttles and attempted to shove the column forward. This process was repeated several times as the aircraft continued on approach at an altitude between 500 and 600 ft. At 3/4 miles, the runway came into view 15 degrees to the right and about 50 ft. below the level of the aircraft. The command pilot continued fighting for control of the aircraft, but was

Coordination ?

only able to apply intermittent power. Consequently, the airspeed had eroded to 80 knots so the command pilot elected to allow the aircraft to set down short of runway rather than risk a stall and/or striking an aircraft awaiting takeoff clearance just to the left of runway. After the aircraft came to rest, the copilot closed the firewall shut-off valves and ran from the aircraft. The pilot closed the master switch, booster pumps, anti-ice systems and also exited the aircraft."

Statement #2

"I was cleared for approach to the airport, via localizer back course runway 10. I then was vectored to the localizer by approach control. Weather was reported as 600 ft., sky obscured, visibility 3/4 variable to 1 mile.

"Intercepted localizer outside the radio beacon, and commenced tracking on localizer using FD 108 Flight Director back course operation raw information. Track on localizer established. Observed beacon passage. Descended to published altitude for listed intersection. Intersection passed, tracking still normal. Descended to published minimum descent altitude. Ground contact was made. Continued flying, tracking localizer at published MDA, and observing time.

"About this time the other pilot apparently became concerned about the approach, and began acting in an agitated manner. As I continued to fly the approach he became violent, attempting to push the power levers forward. I indicated to him that approach parameters were okay, and no further application of power was necessary.

"At the time runway contact was made, I observed an aircraft on left side of the taxiway awaiting takeoff. At this time we were in a landing configuration, gear extended, flaps in approach position, and awaiting the landing flaps. I tried to make a power reduction, finally overpowering the other pilot. He then struck me across the face and hand, temporarily distracting me from the instruments. The aircraft veered left of course, airspeed and altitude deteriorating seriously, an abort was not possible with the aircraft at stall speed. I touched down in a nose-down configuration short of and slightly left of the runway threshold. The nosewheel immediately sheared off, allowing the props to strike the ground. The stub of the nosegear apparently dug into the ground, bringing the aircraft to a very short stop, approximately 500 feet from the threshold of the runway, and left of same.

"As soon as the aircraft stopped, I secured the firewall shut-off valves and egressed via the cabin door, observing the other pilot securing the master switch upon his egress from the cabin door."

* * *

Although the temptation to comment is strong, no pointed statement concerning either pilot's action is made. However, to achieve "tranquility in the cockpit," a pilot and copilot must function as a team and not "opponents" engaged in hand-to-hand combat.

Courtesy — Flight Safety Foundation

For added insight into a professional challenge that has faced most of us at one time or another, come along as . . .

An Airline Pilot looks at

Crosswind Landings on Slippery Runways

by Captain John B. Clark
American Airlines

TO BEGIN, I'D LIKE TO PRESENT the anatomy of a typical mishap which could take place while attempting a crosswind landing on a slick runway. This accident is purely hypothetical, but it's based on actual accident experience.

The aircraft is a large, swept-wing, four-engine jet transport, equipped with thrust reversers. The landing will be made on a 10,000 foot runway on which the braking action is reported as "fair to poor" with ice and snow, or just plain water, on the surface. Ceiling and visibility are good, but there is a 10 to 15 knot crosswind from the right, 90 degrees to the runway heading. Although the crosswind is near the maximum allowable for the slippery runway, it is within limits. The crew has carefully checked the performance data. The pilot flies a stable final approach in a slight upwind "crab" and the aircraft crosses the end of the runway, over the centerline, at the proper airspeed. As he begins the flare, the pilot lowers the upwind wing slightly and uses enough downwind rudder to align the airplane's centerline with the ground track. The aircraft touches down on the centerline of the runway, upwind gear first. The pilot lowers the nosewheel to the runway, calls for spoilers to the ground position, and moves the throttles to reverse idle.

A textbook landing so far, but trouble soon begins. Immediately after touchdown the aircraft's tires begin hydroplaning or skidding. The crosswind begins to take effect and the airplane starts to weathervane to the right while being blown to the left. The pilot tries to correct the leftward arcing path with right rudder, and possibly nosewheel steering, while applying reverse thrust. This right rudder aggravates the weathervaning and, because the landing gear tires are skidding, does nothing to correct the track which is veering more to the left. Suddenly, the left main landing gear leaves the runway surface.

The events after this point may vary, but the accident has occurred. With luck, if the ground near the runway

is smooth and there are no obstructions, the only damage might be a muddy landing gear and some bruised egos. With rough terrain off the side of the runway or an obstruction (like a drainage ditch), the landing gear could be torn off, a wing sheared, fuel tanks ruptured, fire, and the airplane might be completely lost — along with the people aboard. Our concern is not with what happens after the landing gear leaves the runway but how that departure can be prevented.

Let's take a look at figure 1, a diagram of the accident we just discussed, to see what went wrong and how the pilot could have saved the situation. Notice that the airplane's track down the runway describes an arc toward the downwind side. This uncontrolled downwind arc is unique to crosswind landings on slick runways and will *never* be present on a dry surface. On a slick surface the airplane is blown sideways by the crosswind. Flight controls are normally capable of changing the heading upwind but unless wheel traction is available this heading change accomplishes nothing beneficial. In fact the weathervaning *together with reverse thrust* provides an additional energy source to push the airplane toward the downwind side of the runway. Reverse thrust works opposite to the direction the airplane is pointing, *not* opposite to whatever ground track it is taking.

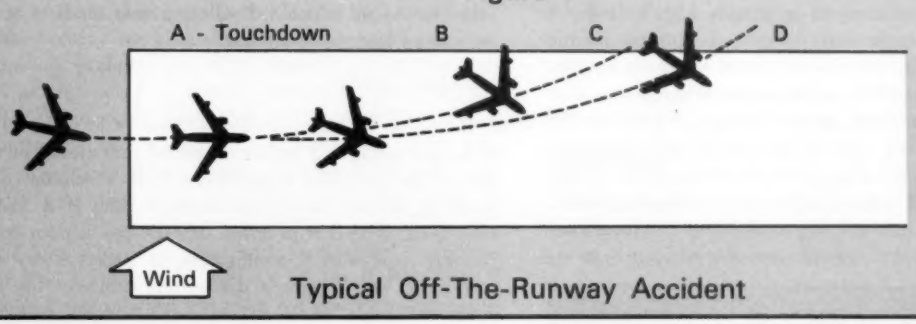
At point B the reverse thrust does little to slow the airplane and merely tightens the downwind arc ground path. With maximum reverse thrust, the airplane will leave the runway at point C. With light reverse thrust, it will probably leave the runway at point D — and at a lower groundspeed. Furthermore, the airplane would have remained on the runway even longer if the heading had remained parallel to the runway as reverse thrust was being used.

There is one other important point to be seen in this diagram. Notice that *all* the action has taken place in only one *half* of the available width of the runway! The whole upwind side was there to use but the airplane was never on it except for a moment or two right after touchdown.

Upwind Touchdown

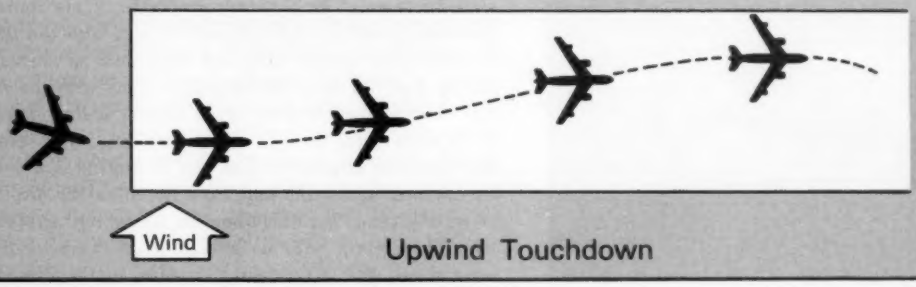
Figure 2 shows how the typical off-the-runway mishap we've described could have been prevented. All the con-

Figure 1



Typical Off-The-Runway Accident

Figure 2

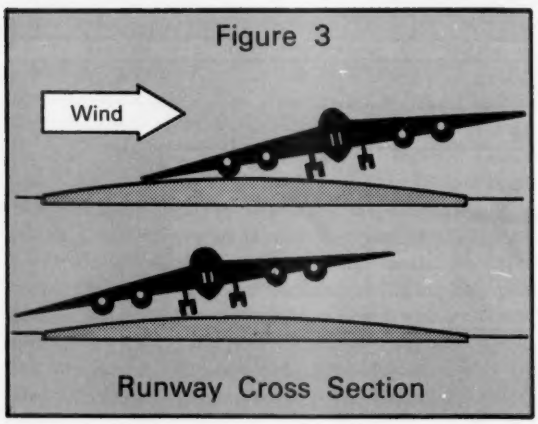


Upwind Touchdown

ditions are exactly the same except the pilot's techniques. As he begins his final approach, he has already planned to touch down on the upwind side of the runway instead of on the runway centerline. There are at least two good reasons for this.

First, there will be more runway width available for the downwind arc which the pilot knows may occur after touchdown. For example, if the airplane straddles the centerline of a runway 200 feet wide, there is approximately 85 feet of pavement between the downwind landing gear and the edge of the runway. If we move the touchdown point to put the upwind landing gear 45 feet from the edge of the runway, we'll have 125 feet of hard surface between the downwind landing gear and the grass — an increase of about 47 percent! With this extra runway, the airplane could probably have been slowed enough to stop skidding or hydroplaning before it went off into the dirt. *(Ed note: Captain Clark is assuming a tread width of 30 feet. The C-141 tread width is closer to 20 feet so with the upwind gear 45 feet from the edge, there would be about 135 feet of useable runway on the downwind side.)*

Additional wing tip clearance due to the crown of the runway is another advantage to landing on the upwind side. With a swept-wing jet in a nose high attitude, it takes very little bank angle to drag a wing tip on the ground because as the nose is raised the wing tips actually move down. *(Ed note: Our experience proves this. In most C-141 mishaps where a wing scraped on the ground, the trailing edge of the aileron was damaged. The aircraft was nose high and the trailing edge hit first.)* Runways are built with a crown, or raised in the middle, to allow water to run off. Figure 3 shows a typical runway cross-section and you can see the additional clearance available. This extra clearance is also available when making a crosswind landing on a dry runway and a smart pilot will use it to good advantage.



After touching down, the aircraft starts following the same downwind arc as before; the pilot is unable to do much about it. The flight controls are not effective in correcting the aircraft's track, but they *can* correct the airplane's heading. The pilot uses them to keep the airplane's center line aligned with the runway — he does *not* allow the airplane to weathervane. In this way, when he applies reverse thrust, it will act more directly opposite to the airplane's direction of travel.

This technique also reduces the side loads on the tires, an important factor as the aircraft slows enough to gain traction. During the initial part of the landing roll, the tires will be skidding or hydroplaning and they cannot generate any braking or steering force. By reducing the side loads on the tires, traction will become available earlier in the landing roll and can be used immediately for braking and steering.

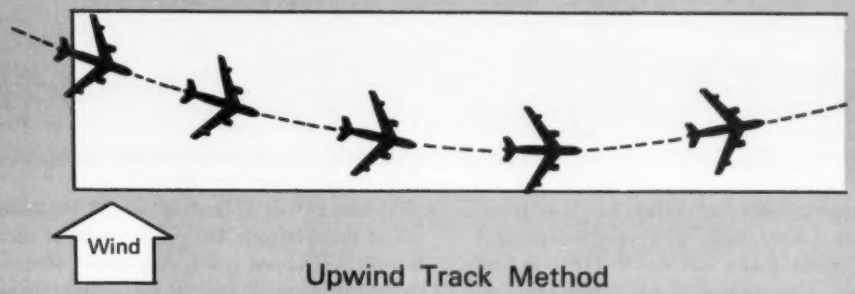
These techniques — touching down on the upwind side of the runway and not allowing the airplane to weathervane — will be adequate to handle most crosswind landings on slick runways. However, there is another technique which will allow a safe landing under even more adverse conditions.

Upwind Track

Before we begin, a word of caution is in order: This technique requires a higher degree of proficiency on the part of the pilot. Any major errors in its execution could result in a more dangerous situation than if it hadn't been used. With that in mind, let's see how a pilot could possibly cope with a combination of slick runway and crosswind, which exceeds the normal limits of his aircraft.

Take a look at figure 4, which illustrates this technique. In this case, the pilot again preplans his landing and establishes a stable final approach. This time he aims for a point on the downwind side of the runway, tracking toward the upwind side. As he begins the flare, he lowers the upwind wing and cross-controls normally, but he *does not* align the airplane's track with the runway. Instead, he keeps the track headed slightly *toward the upwind side*. Touchdown is on the runway centerline, and the airplane begins the downwind arc we've seen before. Again, the pilot does not allow the airplane to weathervane, but this time he keeps the airplane's centerline *aligned* with its *ground track*. This way, reverse thrust will act directly opposite to the direction

Figure 4



Upwind Track Method

of motion and there will be no side load on the tires at all — the best possible conditions to slow the airplane and gain traction for steering and braking. The pilot keeps the airplane aligned using flight controls — if they are effective enough — and differential reverse thrust if he needs it.

The biggest hazard of improperly applying this technique is immediately apparent. If the pilot misjudges the touchdown point, and lands close to the upwind side of the runway tracking sharply into the wind, the airplane will probably go off the upwind side of the runway at high speed — a very undesirable situation.

But, if properly used, this technique will enable a pilot to complete a safe landing under the worst possible conditions. Many years ago I used this technique during a landing at Boston during Hurricane Hazel, in a massive crosswind and heavy rain. I am convinced I could have done it no other way. Incidentally, conditions were bad enough so at the end of the landing roll, I was applying forward thrust on the upwind engines and reverse thrust on the downwind side to maintain the desired heading.

Cautions

Anytime an airplane is operated off the centerline of the runway, it is exposed to the danger of collision with obstructions located near the runway. Snowbanks, parked construction machinery, and even other airplanes have all been hit at one time or another. *(Ed note: The optical lighting systems found at some Navy bases can also be a problem. Check the legend on your letdown plate for details.)* Knowledge and planning can minimize this threat. Find out if there are obstructions near the runway, where they are, and plan for them.

Low ceilings and poor visibility may make these techniques unuseable, particularly the Upwind Track method. For any visual landing you need a certain amount of time to set up your approach. To use these techniques you'll need more than may be available if your approach will be in weather to Category I or II minimums.

Using differential reverse thrust for steering is not a common or simple technique. Properly used it is a valuable tool. Faulty execution, however, could easily lead to serious aircraft control difficulties. Pilots should practice the technique under controlled conditions before attempting to use it under adverse conditions. Unfortunately, it's included in very few training programs.

Conclusions

Conventional crosswind procedures are adequate for dry runways, but if the runway is slick, the pilot must use optimum techniques to prevent a typical off-the-runway mishap. By making all normal landings with the utmost precision, a pilot can develop the skill necessary to use the Upwind Touchdown method we have described. If conditions are so bad this technique will not ensure a successful landing, the Upwind Track method may be required. However, this method is very difficult and the pilot must fully understand the principles involved and the possible risks he's taking before attempting it. I would recommend that it *not* be used until the pilot has had a chance to practice each element of the maneuver — particularly the use of differential reverse thrust — under controlled conditions.

(Condensed from a paper presented by Captain Clark at the Flight Safety Foundation's 24th Annual Air Safety Seminar, Mexico City, 20 October 1971.)

What is cheaper to replace: a C-141, a C-141 engine, or a fuse plug from a C-141 wheel? The answer may be under your feet.

Stopping Starlifters

by Capt Phil Budd

AIRPLANE STOPPING, OVER THE YEARS, has been transformed from a very basic to a very complicated system. When Captain Eddie and the Red Baron first checked out, their crates had no brakes. Their stopping method in those days was to pull back on the stick, dig the tail skid into the turf, and pray the field was long enough.

As technology increased, the tail skid gave way to the tail wheel and airplane stopping became more of a challenge. If the field wasn't long enough for the machine to coast to a stop, the pilot stomped smartly on the rudder bar and ground looped. (Just think what your boss would say today if you tried such a procedure to stop your machine.) Finally, ground looping gave way to brakes. Eventually, refinements for better stopping included automobile type drum-and-shoe brakes, expander tube brakes, disc-and-puck brakes, anti-skid devices, spoilers, reverse thrust, drag chutes, and tail hooks and arresting gear.

Many aircraft in our modern MAC fleet are equipped with more than one of these stopping devices. Take for example the C-141, which boasts anti-skid brakes, spoilers, and reverse thrust. With these, this aircraft can be stopped safely on most runways under most conditions. But before you run out and try to land your Starlifter on a 4,000-foot runway with an RCR of 04, read on to see just what variables should be considered, and what Mr. Lockheed gave you to do the job.

Let's start on final approach, before the landing, and see what procedures and techniques you can use to turn off the end of the runway without developing a post-landing crew laundry problem.

Approach Planning

There are many variables you can control prior to touchdown which will make your job of stopping a lot easier. Airspeed, glidepath, touchdown point, and drag versus lift configurations are all important in the approach phase. Good prelanding planning for the specific runway you're landing on will determine how you adjust these factors. The most crucial of these variables is your touchdown speed. Any excess airspeed at touchdown will increase your stopping distance a bunch — typically a 10 percent increase in stopping distance for each 5 percent extra in touchdown speed. A 10 knot excess in some aircraft will increase the landing roll by 1,000 feet.

It's also important to land into the wind. At some Pacific islands you may be cleared to land any direction you desire. If you land downwind, you add extra knots to your touchdown ground speed. As a matter of fact, landing downwind is double jeopardy since you add the tailwind and give up the headwind.

What the captain means is . . . stop and think before adding five or ten knots for mommy and the kids.

PLAN IT; PLANT IT. Stopping starts before you land.

The runway condition is another item you should consider prior to landing. Landing on a wet or icy runway will affect your braking distance. Because of the reduction in the coefficient of friction, the landing distance can increase as much as 40 to 100 percent (in some tests, 200 percent). Gross weight, density altitude,

and wind all play a role in this increase. (Not to be discussed here, but something to think about in these conditions, is hydroplaning; check the May 1971 issue for a thorough discussion of this complex phenomenon.)

Touchdown point is also an important variable. Cross the threshold at 50 feet and plan for a minimum finesse touchdown. Don't hold it off for a grease job while 1,000 feet of runway slide beneath you. Keep in mind that the runway behind you is as useful as a mother-in-law on your honeymoon.

Okay, we've said you should plan your landing before you touch down. You should consider wind direction, airspeed, glidepath, runway condition, and touchdown point. Now you are on the runway and your job is to stop your machine in whatever runway you have left.

Spoilers

In the C-141, you call for spoilers as soon as the main gear tires are on the ground. The Starlifter's spoilers produce aerodynamic drag and destroy lift. The reduction in lift puts more weight on the tires and improves braking. Aerodynamic drag is most effective at high airspeeds and will be of little value at less than 60 to 70 percent of the touchdown speed. So, spoilers are most effective and important right after touchdown. *However,* your wheel brakes will be the principle stopping device if minimum stopping distance is required.

Reverse Thrust

As you call for spoilers you also place the throttles to the reverse idle detent and lower the nose to the ground. When the nose gear is firmly on the ground, you apply reverse thrust as required. Reverse, like the spoilers, is most effective at high airspeeds. But again you must *depend on brakes as your primary stopping device* if you are performing a minimum run landing.

Brakes

What we have said to this point is: airplane brakes provide the most important means to stop your aircraft during landing or a rejected takeoff. The brakes were designed for use as a one-time good deal. You can accelerate to refusal, slam on the brakes, and stop on the remaining runway. But if you do this, don't try to taxi back and attempt another takeoff. Because if you do — and have to abort again — you will melt fuse plugs and blow tires. Anytime you use the brakes above 60 knots you must go to the Dash One and determine the heat buildup and cooling period required. You must also follow all of your local directives pertaining to brake cooling after an aborted takeoff. *(Ed note: These rules should not affect your use of the brakes if you need them.)*

Landing Roll (Runway 10,000 feet plus)

Let's see now, we have you on the ground, spoilers deployed, throttles in idle reverse detent, nose wheel on the ground and going into reverse thrust. If there is plenty of runway left, check your brakes to see if they work. If they do, fine. If they don't, select emergency and remember you don't have anti-skid or fuse protection any more. But let's assume everything is normal. You've checked your brakes and they're working fine. You start to bring the throttles out of reverse when the copilot calls 80 knots and you have them in idle reverse

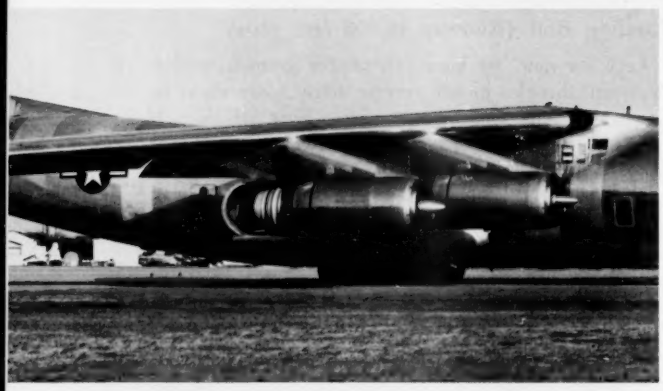
MOST EFFECTIVE AT HIGH AIRSPEED, the spoilers and flaps make the C-141 look like a peacock ruffling its feathers.

at 60 knots. Then you use gentle braking to reduce to taxi speed and slowly turn off the runway. So goes a normal landing roll on a nice long runway — 10,000 feet.

But what do you do when your mission has you landing on a shorter one? Let's define "shorter" as 7,000 feet or less. We have seen C-141s land on short runways and turn off the end with engines belching fire — compressor stalling — because the pilot didn't want to use the brakes above 60 knots. We have also heard that some C-141 pilots have gotten the notion that the C-141 binders shouldn't be used above 60 knots! *Untrue!* The only restrictions on brake use above 60 knots is that you must have the flight engineer check the Dash One for the cooling period prior to attempting another takeoff.

Landing Roll (Runway 7,000 feet or less)

You have just landed on a short runway. You've deployed the spoilers, lowered the nose gear to the ground, applied reverse thrust; *now use the brakes!* You will know when you are getting maximum braking when you can feel the anti-skid system kicking the brake pedals. If you can't feel it you are not at max braking yet. As you start out of reverse thrust at 80 knots and reach idle

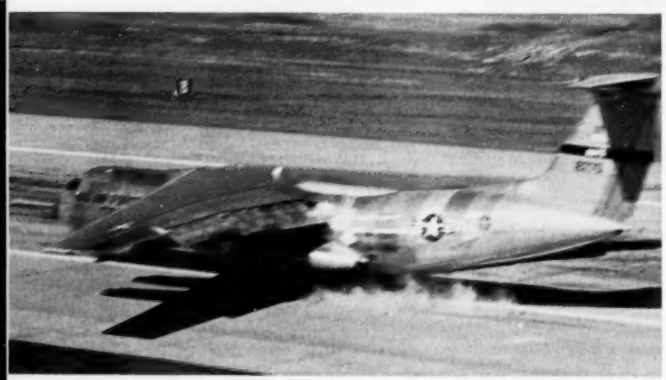


SHOOTING EXHAUST FORWARD, the Starlifter's thrust reversers decrease the landing roll.

reverse at 60 knots, *continue* to use the brakes to stop. Then, tell the engineer what the airspeed was when you applied the brakes, and he will tell you how hot they will get, the required cooling time, and if you need to evacuate the plane. *What the captain means is* . . . it is better to use brakes and melt a fuse plug, than to damage an engine by compressor stalling it to death in max reverse, or damaging an airplane by running off the end of the runway. *(Ed note: If using all these procedures won't stop you, then by all means, use reverse thrust with your brakes as long as you need to.)*

Sermon

What the captain *really* means is . . . the C-141 brakes are there to be used. But you must plan your approach so that you have everything working in your favor when you touch down. Then, using the stopping devices the designers have provided, you can stop your Starlifter safely and efficiently.



SMOKING TO A HALT, the Starlifter relies on brakes as its basic stopping device. Don't be afraid to use them.

Speak Up !

YOU'VE BEEN HEARING a lot lately about communicating — closing the information loop, talking back, contributing your ideas about the operation you're in. We of THE MAC FLYER staff have always welcomed and encouraged reader inputs, and now we are making it especially easy for you to speak up.

On the next four pages you'll find four reader response forms — one for you plus three for your TMF-reading friends. Cut one out, grab a pen and any issues of the magazine you can find, and invest ten minutes in helping your safety magazine. Think about the various features we've listed — decide which ones you like or don't like, and which ones you never read. Then check the appropriate blank. Now, spend a moment in deep thought about your magazine — tell us what you like best and least, what you'd like more of and less of, and what changes you'd make for a better publication. Finally, please provide a bit of data about yourself — not enough to remove your anonymous status, but enough to give us an idea of what kinds of readers we have.

All that's left now is to fold the sheet, fasten the long edge with a bit of tape, and drop your response form in a mailbox. A howgozit report will be included in a future issue.

Okay, those are the guidelines. Now, take your form and tell us what you think. Speak up, readers.

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CUT ALONG SOLID LINE

Speak Up!

Reader Response Form

How would you rate the following features?

Feature/Type of Article	Dead	So-So	Okay	Great
Aerodynamics				
Weather				
Mishap/Accident Review				
Maintenance				
New Equipment				
Transport Aircraft				
Helicopters				
Special Purpose Aircraft				
Mission Support				
Medical/Dear Doc				
Good Show				
Unit Specials				
Interviews				
COMAC Features				
Photo Stories				
Writing Contest Winners				
Short Stories				
C. R. Terror				
Quick Stoppers				
Silhouettes				
Analyzer				
Other: _____				

The feature I like **best** is _____

The feature I like **least** is _____

I would like to see **more** _____

I would like to see **less** _____

I think you could improve The MAC Flyer by _____

_____

_____

Overall, I would describe The MAC Flyer as _____

_____

Facts about you:

Age Under 21 ___ 21-25 ___ 26-30 ___ 31-35 ___ 36-40 ___ 41-45 ___ 46-50 ___ Over 50 ___

Type of aircraft _____ Job title _____

Anything else? _____

CUT ALONG SOLID LINE

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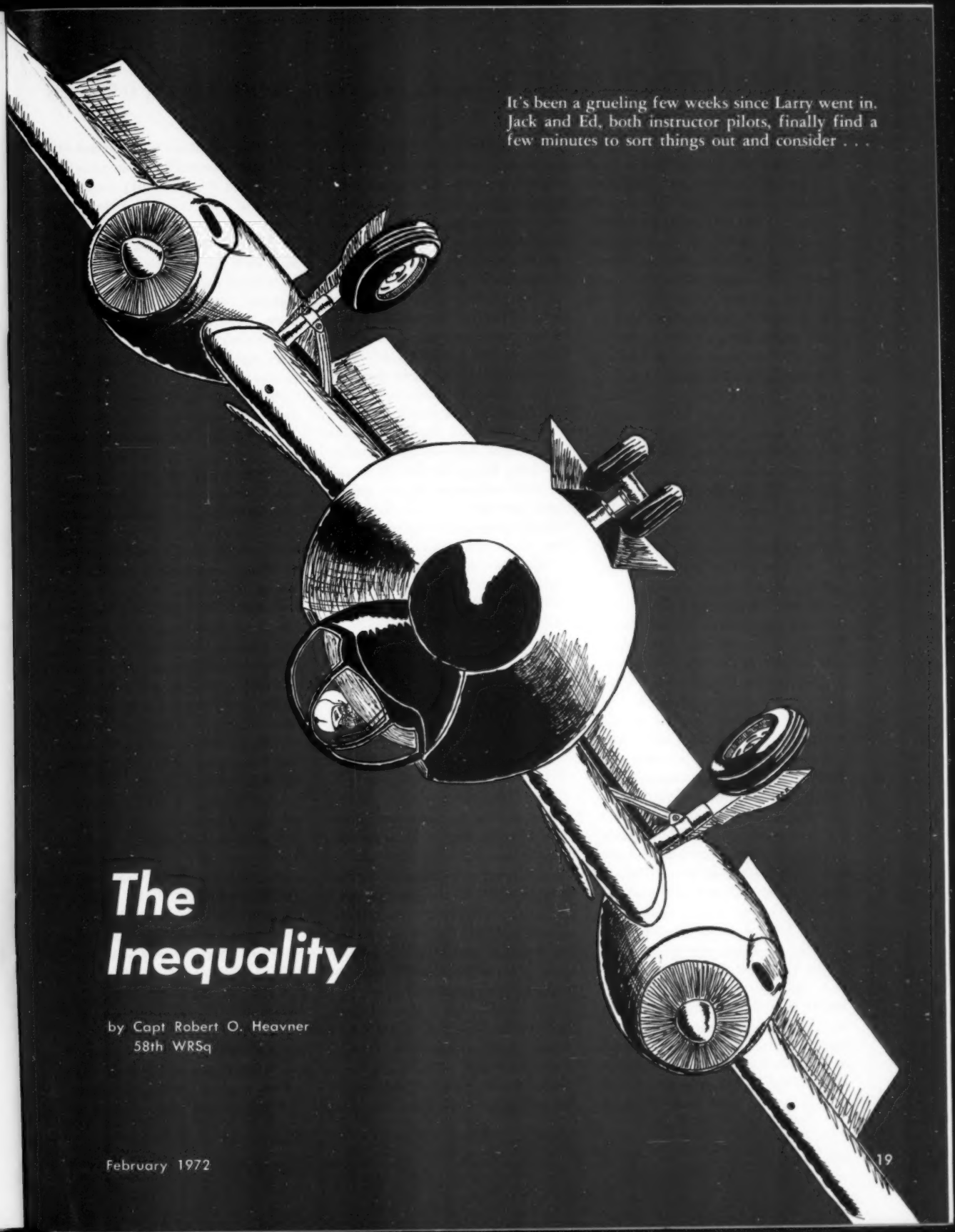


It's been a grueling few weeks since Larry went in. Jack and Ed, both instructor pilots, finally find a few minutes to sort things out and consider . . .

The Inequality

by Capt Robert O. Heavner
58th WRSq

The Inequality

DID YOU GET THEM OFF OKAY, Jack?"

"Yeah. The plane was a little late, though."

"I'll bet you're glad that's over."

"Ed, I'd rather do another SEA tour than be a summary court officer again. Bad enough to lose Larry — but having to keep facing Sally every day was grim. Saying good-bye was even worse. But our last conversation there in the terminal kind of stimulated my thinking."

"Oh? What did you talk about?"

"Well, Sally was talking about little Holly — wondering how much she understood about the accident. She knew Holly would ask, 'How did it happen?' when she is a little older, and Sally wanted to know how I'd answer. I was trying to be helpful without hinting that Larry may have had a large part in causing his own death."

"Yeah. I guess even though no findings have been released, there seems to be a consensus around here that he'll get a rap for pilot error."

"Ed, one question that Sally asked really grabbed me: 'How do you tell a child, when she's old enough to understand, that her daddy, who collected three DFCs, umpteen air medals, a Well Done, and even a MIG probable, helped kill himself by an improbable set of happenings?' "

"I've been asking myself that same question ever since we started looking at pilot error as a contributing cause. Larry was one of the better pilots I've known. I don't understand how he could have boxed himself in the way he apparently did."

"It's ironic, too. Sally told me she'd been relieved when Larry got his orders from SEA to the '57. I guess she felt the Phantom was a little treacherous, and a slower airplane would be much safer. She and Larry were at Eglin right after pilot training, before he went over. She told me a couple of his classmates spun one in down there and they lost another on the range. Larry sure didn't feel that way, though. It's no secret around the squadron that Larry volunteered for the '57 only because he knew he couldn't get a TAC slot here or overseas."

"Yeah, we talked about it on our first TDY. Larry said that once you've tasted air-to-air, nothing in flying can ever come close. It's really a shame a guy who loved that mission so much couldn't manage an F-4 after his SEA tour."

"Ed, actually I think he felt he was sort of between TAC fighter jobs here. Flying the long-wing and the short-wing were to him unwelcome interruptions. Say, Ed, were you able to get anything worthwhile from the wreckage?"

"Yeah, and keep this to yourself. The throttle quadrant was almost in one piece. Number 2 was in idle cutoff, just as he reported."

"How about Number 1?"

"It was at 100 percent. And, of course, he had the gear and flaps extended."

"Hmmmm. Anything else?"

"Yeah, but I can hardly believe it . . . the speedbrake switch was in 'extend.' "

"You're kidding."

"No. And the boards were out. Take what appears to be a routine day. Add an overheat — real for a change. Interesting but not deadly. But add a stiff crosswind from the south — nothing new around here — an overhead right 360 to runway 08. Just like we practice in the checkout program. This all adds up to a challenge but not an accident."

"I agree, Ed, but it does kind of tip the scales, wouldn't you say?"

"Sure, but Larry should have been able to handle it."

"The Larry we flew with, sure. But we could only simulate an emergency — something we could call off if it turned sour. That's part of being an IP. And although Larry was good, we never knew what he'd do in an actual emergency."

"The nav's narrative fits pretty well with the One-Hundred driver's view from the ground — a sudden roll and yaw like nothing either of them had ever seen before. If the nav hadn't been spring-loaded to eject, we'd have had two folded flags to hand out."

"Ed, if he was so alert, why'd he miss the speedbrakes? The dive fingers are clearly visible from the back seat."

"Well, I had the impression he didn't know what Larry expected from him. Like some of us, Larry didn't always use the nav or give him specifics. I left the boards out on a single-engine once, and my nav missed it too, and he was an old head in the '57. I was lucky, though; I had an alert wingman. Another jock I knew at Danang tried a single go-around on one with the boards out. Both guys ejected too late."

"Ed, let me see if I understand the situation Larry was in: A real single-engine, crosswind from the south, on final turn to 08, with gear, boards, and flaps out."

"You're with me. Pretty complex, but no accident so far . . ."

"But the throttle at 100 percent — that's precisely what we preach against, Ed. You know, single-engine out-of-control and all that. I know I practiced that with him."

"I know you did, Jack, and I'm sure he did it well. This part is what's puzzled me most. I mean I spent hours on it. See if you follow me. I flew T-34s and T-33s in pilot training. I didn't know what an engine-out landing was, or a single-engine landing, as we call it; SFOs but not a single engine landing. My first single-engine approach was dur-

ing checkout in the Canberra. And they showed us trainees a movie I'll never forget — a Martin test pilot trying to go around, too low and too slow. I became a believer."

"But Ed, Larry and I flew '37s and '38s in UPT, and we practiced single-engine work from day one."

"Uh huh. Let me ask you a question: In single-work here, what principle do we stress?"

"Keep the airspeed up and the ball centered."

"Okay. Now — and I had to talk to a lot of your contemporaries to see this: What did your UPT instructor teach?"

"Well, Ed, my memory of the '38s is kind of hazy. But we used to keep up the airspeed, too, and use partial flaps."

"And if the airspeed got low?"

"Go burner. We had a bunch of thrust even on just one. Hmmmm, I think I'm reading you. I remember my IP saying, 'You won't be noticeably uncoordinated on a single-engine, maybe a quarter of a ball-width. But it's no problem, and that's the beauty of center thrust.' And Ed, more than half of the IPs were former Thud or One-Hundred, or F-4, or ATC only guys. You know how TAC and UPT instructors rotate between jobs."

"Right. And the aircraft and instruction are designed to turn out fighter pilots. Didn't you even get an eleven-eleven AFSC at graduation?"

"Yeah."

"And in Larry's case, his UPT training was reinforced by flying the Phantom, another center thrust airplane. Jack, do you remember this symbol, $>$, from math?"

"Sure. We always called it an inequality. You can use it between two values to show one is bigger than the other, like a is greater than b."

"Okay, now let's put our ability to cope with a situation on one side of the sign and our inflight emergencies on the other."

"Normally we have an inequality: ABILITY TO COPE $>$ ACCIDENT FACTORS. Great. With that situation, we get a safe complete sortie. But when we get a new pilot, the inequality is probably reversed, so we fly him with an instructor until 'ability to cope' increases sufficiently. And, of course, we work to improve that ability through annual and no-notice checks, proficiency flying, and all sorts of information and education programs. And we work and work to reduce the right side, too: quality control in maintenance, TCTOs to make our birds safer, and more information and education. Aircraft design has made our inequality more favorable. Our newer multi-engine birds have redundant systems and gobs of thrust; we don't even carry parachutes. And in the high performance fighters, the engineers are giving us a better edge all the time. But we still recognize that in a supersonic bird, flown close to its design limit, our inequality sign can suddenly reverse. So, we have zero-zero ejection systems."

"Ed, that's an accurate perspective."

"Thanks. Now let's look at Larry's accident. His ability factor was a constant, determined by his experience prior to strapping in that day. On the other side, he had: single-engine configuration, plus crosswind from the right, plus right break, plus good engine on the outside of the turn. Oh yes, Jack, I almost forgot another factor. Larry declared an emergency, but he didn't give Mission Control a chance to get a short-wing pilot into the mobile control station wagon. Let's call that an additional part of the right side sum. Now the inequality sign is approaching equal and starting to reverse, but Larry can't tell how close to that reversal he is. He's engrossed in the developing problem, calling upon his best effort to avert an approaching disaster. He's not even talking to his nav, who's about to pull a handle and give it all back to the taxpayers. Larry's at the wall and his strongest flying habit patterns prevail: Throttle max."

"And he bought it."

"Jack — I'm weary. Every couple of years we get new pilots into this old beast, and we have to hack away at habits we didn't help form. This plane is a 1953 model, old and quite different from today's vintage. And we can't go around painting 'Danger: Non-Center Thrust' on them. And we can't beat ATC over the head either. They use good, safe trainers, and the IPs naturally teach what most of them know, center-thrust airplane flying."

"Ed, I guess then we've got to work on the pilot as we get him. Looking at your inequality, Larry could have kept the right side a whole lot smaller by making a left break or by giving more time to get the mobile vehicle out to the runway. A sharp troop in mobile might have caught the speedbrakes and offered some timely advice. When Larry was about to go max on the throttle he was grasping at straws, falling back on what may have rescued him in an earlier jam. When you feel that close to the edge, it's time to step over the side . . . At least everybody else will be alert now for this kind of accident."

"Yeah, but for how long?"

"That depends upon how well we do our jobs."

"You know what bugs me the most, Jack?"

"No."

"We have to wait for something like this before we think these possibilities through and really talk about them."

DEAR DOC

This month Doc offers some specific answers to a knotty question about the problem of . . .

Dear Doc,

I've been in this flying business for several years now. During that time I've listened to you body mechanics preach over and over again about the dangers of self-medication. In the past few months I've also had pharmacists and reformed junkies tell me about the dangers of LSD, Speed, and everything else you can think of, including my morning coffee.

Okay, I'm convinced that drugs are a no-no. If some sneaky looking guy on the street offers to sell me a handful of pills, I won't buy them.

But let's be reasonable about this. I do take drugs. I start almost every day with some caffeine and on some occasions I've been known to imbibe a little alcohol. I've used nicotine, and when I have a headache, I take aspirin.

My point is this: all of us take drugs in some form or another — some relatively harmless and others that may be really harmful. How am I supposed to know which are which? When I go into a drug store, which items should I avoid if I'm going to fly or drive a car soon after? And please, don't tell me something like "dextromethorphan hydrobromide." I'm not a doctor and I don't always read all the ingredients because I wouldn't understand them if I did. Please use simple terms. Thanks.

Puzzled Pilot

...and the Flying Man

Dear Puzzled,

Your point is well taken. Virtually all of us take drugs of some kind. We must, however, always keep in mind the effects of the drugs we take. Some of our everyday drugs, like caffeine in coffee, produce few side effects and can be taken before or during flight. With others we may have to be a little more careful.

For example, a few years ago at one hospital, we found three pilots who were apparently having heart attacks while taking their annual physical exams. Turned out that they were taking diet pills they'd gotten from their wives. (The pills were diuretics or "water pills" — ask your wife, she probably knows all about them.) They were losing weight, but they were also experiencing side effects they hadn't counted on.

Let me answer your question specifically. Here is a list of commonly available drugs which cause drowsiness and which should not be taken before flying or driving:

Coricidin — cold relief tablets
Dristan tablets
Allerest
Dristan Nasal Mist
Vicks Formula 44 Cough Syrup
Contac — cold capsules
Cheracol capsules
Cheracol Cough Syrup
Cope
Anahist
Nyquill
Sleep-Eze
Sominex

You'll notice that some of these are sold as "sleeping pills" so the resulting drowsiness shouldn't be a complete surprise. The others are mainly "cold remedies" but will make you almost as sleepy

On the other side of the fence, these drugs will cause increased restlessness and irritability:

Vicks Va-Tro-Nol Nose Drops
PAC Compound
No-Doz

There are just a couple of more points I would like to make. First, you know you don't have to be falling-down, knee-walking drunk to be under the influence of alcohol; likewise, you don't have to be glassy-eyed or on a trip to be under the influence of drugs. A little drowsiness, a slowing of physical reactions, a little confusion which produces an error in judgment; one of these at a critical time in flight can be disastrous. You don't have to be bombed out of your mind to be in trouble.

One last thing to remember: The total effect of a combination of drugs usually is more than the sum of their individual effects. A headache tablet might not bother you. A cold remedy might not bother you. A tranquilizer might not bother you. But if you take them all together you may easily get much more than you expect. This goes double if you are tired or upset and can be ten times worse if you add some alcohol to the mixture. Several very prominent people discovered this the hard way in the last few years.

We all take drugs of one kind or another. We take some of them without a prescription and without a doctor's supervision, normally with no ill effects. But we should always know what we're taking and what it might do.

See ya around the system,
Doc

Despite engine ice and low RCRs, the World's Greatest Aviator perseveres to establish another record — in a shower of stars.

JOSTLED OUT OF BED by an early morning earthquake, C. R. shaved and showered. In an hour he would be alerted to fly the courier to the east coast — first north to Travis and then hopscotch across the country. Checking the phone, the Pudgy Pilot found it out of order. "Always happens after a tremor around here," he muttered, grabbing his hang-up bag and charging out to the base.

As he walked into ACP he could hear Capt Neatnick saying, "Well, the phones are out, and Major Terror hasn't been alerted. Knowing him he won't show till we send someone after him." C. R. smiled to himself, thinking he just might put that young whippersnapper in a brace.

"Ahem, . . . good morning, everyone — and you too, Neatnick," offered the Master Manipulator. "If you'll just hand over my mission folder I'll get on with the flight planning. Has anyone seen Sam or Blinky?"

"No, sure haven't, sir, but you're here a few minutes early. I'll break the news to them when they come in."

With the wave of his right forefinger the Aerial Ace headed for the flight planning room — where a short time later, Sam and Blinky joined him.

"Hey, chief, you're here early. The earthquake scare you?" Sam chided.

"Yeah," added Blinky, "he probably wants to get in the air in case there's another one."

"Duty, honor, and country; that's what brings me here this morning. No little earth shaking is going to run me off. It's a good thing you guys showed up. I've got all the paper work done and ready to make for the airplane. We have no pax to Travis — so let's be gone. Where's the rest of the crew?"

"I saw Sergeant Torque and Sergeant Downs going into traffic when I drove up, so I suppose they're out at the airplane. Do you want me to check?" queried Blinky.

"Nope, let's grab a crew bus and press on. They're big boys — if they want that next stripe they'll be at the airplane. Time's awastin'; let's go!" With a flurry of black satchels and hang-up bags, the Trio of True Professionals departed for the waiting Starlifter.

* * * *

Preflight, departure, cruise — all clicked by without a hitch. It wasn't till letdown that things started to

turn rotten. They checked with Travis ACP for the load information — which they got. But they also found the forecast 800-and-2 was now 100 obscured!

"Rog, 70020, metro says we'll have minimums in about 30 minutes. We'll pass the word through approach. ACP out."

"Sam, you got the bird. Put us in holding at 3,000 feet somewhere and wake me when we're cleared for approach." C. R. tilted his seat back and closed his eyes.

At 3,000 feet the sun was shining brightly with nothing but blue sky above. What seemed like minutes to C. R. was actually an hour and a half. Then Sam awakened the slumbering ship's captain and gave him a quick briefing.

"Metro's calling minimums and we're headed toward the localizer now. They say the weather is 200 feet, RVR 2,400, temperature 32 and no wind," briefed Sam. C. R. took control and flicked off "George."

"Okay men, how's the descent checklist coming?"

"Completed except for your briefing, chief," Sam responded.

"Ah, uh, roger, let's see — we'll make an ILS to 21 left, the minimums are . . ."

"Start your turn inbound, boss," Sam interrupted, "you're passing through the localizer."

"Rog, turning inbound and let's see this will be ah . . . a progressive briefing. I'll get it configured now." C. R. shook his head getting rid of the cobwebs from his little nap. The gear came out and flaps down about the same time the amber outer-marker light started blinking. Sam called the outer marker inbound and the sleek Starlifter slipped into the soup. Seconds later a loud popping noise grabbed everyone's attention.

"Hey, loadmaster," C. R. commanded. "Check the cargo compartment to see if you can see anything loose and banging about."

"Yes sir," Downs answered.

The popping noise changed to small explosions which shook the airframe. All of a sudden the noise stopped and the '141 yawed and rolled violently to the left. As he struggled to regain control, the Ace Aviator glanced out his window to check the wing. To his astonishment, both engines were completely iced up and ice was building rapidly on the leading edge.

"Turn the anti-ice on!" roared the Fat One as he strained against the yoke. He and Sam had full right aileron, all throttles fire walled and were pulling on the yoke. As the anti-ice came on, the ice started to shed— the continuous ignition ignited the engines — they belched, compressor stalled — then caught. With C. R. holding full right aileron, much back yoke and full forward throttles, the sudden surge of power threw the '141 into an 88-degree right bank climbing into a blue sky. C. R. righted the transport from its modified lazy eight and Sam called missed approach.

"What happened?" the Gross Gripper of Go Levers belched. "How come you guys didn't have the anti-ice turned on? Isn't that on the descent checklist?" Sam looked sheepish.

"Yeah, chief, but icing never entered my mind. While we were holding, the OAT was 48 degrees F."

"You dummy! If it's 48 degrees at 3,000 feet and 32 degrees on the ground, that oughta tell you somethin'. Like a temperature inversion maybe? You oughta know Travis is infamous for inversions in the winter." C. R. slapped his head and gurgled, "I've tried to teach you everything I know. But you'll never make it if you don't start listening to me."

Sam bore the Rotund One's chastisements silently, forcing himself not to mumble, "If you were awake like you should have been . . ." Another go at the approach proved successful. They picked up their passengers and leaped off for Hill, the icing encounter known to no one but themselves.

* * *

The weather at Hill was clear and a hundred, but a bit cold — like minus eight degrees F — and with 18 inches of new snow. The snow removal crews had worked all night but the runway was still going to be slick. A quick check with approach control revealed an RCR of 03.

"Torque, check the Dash One for the minimum RCR we can land with—I think it's 04," offered C. R. Then, as he waited, he fired an aside at Sam. "You know, in the good old days we could land anywhere or on anything we wanted to, as long as we thought we could hack it. Ah . . . the good old days," he sighed.

"Sir, you're right," interjected Sgt Torque. "An RCR of 04 is the lowest we can land on. Are we going to divert?"

"Negative," replied the Master Manipulator of Wires and Tires. "How can they measure the difference between 03 and 04? That's like someone telling me there's a difference between Gordon's and Gilbey's in a martini. Divert? Never! We'll land — cautiously — and grab a bite to eat. Ahem, . . . and it will give me time to slip over and say hello to Peggy. Now, if the RCR isn't better for takeoff we just might have to crewrest. It all depends . . ."

C. R. planted the bird in minimum-finesse fashion, momentarily went IFR when he used too much reverse thrust, and slid to a stop with all 13,500 feet of runway behind him.

Once inside base ops, C. R. pointed out the snack bar to his crew. "I'll activate our stop-over flight plan and check to see if the phones are working — join you in a few minutes." A moment with the dispatcher and then the gay seducer was dialing a number. His mind was racing wildly — thinking about the bearskin rug

and fireplace — the fun they had had on the slopes over the holidays. A check with Peggy's office found that she was on annual leave. Then a call to her pad: *"She's where? At the ski lodge with major who?"* A little dejected, the Lothario of the Airlift Game hung up the phone and trudged into the snack bar.

Deep in thought, the World's Greatest Aviator pulled up a chair and plopped down. "Well troops, hurry up. We have a long day ahead of us. Let's try to get off as soon as we can."

"Have you checked the RCR, chief?" interjected Sam.

"No, but it doesn't matter; if we landed on the runway, we can take off on it," C. R. muttered.

"Hey, what's eating you, chief? Did Miss Snowbunny throw ice on your fire?" Blinky giggled. C. R. uttered a low growl, got up and walked out of the snack bar.

Sam looked at Blinky and shrugged his shoulders. "Looks like the leg to Scott will be a quiet one," he said. "Let's get going or he might leave us here. I'll check the RCR and get a couple of SIDs, and meet you at the airplane."

* * *

By now, the runway was better — RCR 06 — and they made an uneventful departure. Cruise was different, to say the least, because the Aviator with Avoirdupois was kind of moody. But by the time they started the en route descent, everything was back to normal. The Rotund One was giving orders and telling everyone how he would perform a minimum run landing on Scott's 7,000 foot runway. His dissertation on stopping the Starlifter was cut short by Kansas City Center.

"MAC 70020, Scott operations requests you give them a call on 372.2."

"Roger, KC, we'll give them a jingle," poked C. R., and he spun the preset frequency selector to channel 15. "Hello, Scotty, this is your intrepid aviator aboard MAC nonscheduled airline flight 007. What is your favor?"

A friendly female voice answered, "MAC 020, request your offload, required fuel load and maintenance status . . ."

"Roger there, young lady, we will be deplaning 36 pax, and we need —" C. R. had to stop and ask the engineer how much fuel was needed.

"29,999.99 pounds give or take a pound," needled Sgt Torque.

C. R. growled at the engineer for trying to make a funny when he was trying to impress the little miss in base ops.

"Ah . . . Scott, sorry for the delay; 30,000 pounds of petrol will tide us over and we're alpha one unless you're not busy tonight."

The WAF dismissed the frivolities of the Chief Charmer of the Couriers and replied, "The Scott weather is clear and 14, temperature is 36, dewpoint is 15, and the winds are 130 at 10. I'm also to advise you that you are to park in front of base ops. There will be a high ranking officer meeting your aircraft. Scott ops out."

The silence was deafening, as the wheels started to spin in C. R.'s head. Then his navigator interrupted him.

"Yeah, chief," Blinky began to snidely chide, "A high ranking officer is going to meet us and he is going to say, 'How did you land at Hill with such a low RCR?' Or maybe he'll ask why we made a missed approach at Travis."

"Okay, knock it off, I'm trying to think. Sam, take control here and start the descent checklist." C. R. slipped out of the seat.

As Sam leveled off at 2,100 feet on downwind leg, the Prelate of Pilotage returned — dressed in his custom made Class A's and spit-shined Wellingtons, and reeking from a good shot of Hai Judo body lotion.

Now, in a special effort to do everything right, he took control of the gray and white Starlifter, and quickly briefed the crew to keep their mouths shut.

"I'll handle everything, I'll answer all the questions, and baffle them with my expertise and . . ."

Blinky cut in . . . "Confuse them, yes . . . baffle them, no."

C. R. ignored him and kept right on talking. "If we're lucky we'll get off with just a verbal reprimand and then press on to McGuire. If not . . . well, I know some flight nurses here and they should be able to liven up our stay." C. R. plunked the bird on the runway and taxied to the spot in front of base ops. He needed the fragrant body lotion now as beads of sweat dotted his brow — he saw a blinding flash of stars move toward the crew entry door. He cut the fuel and start ignition switches.

"Sammy my boy, clean up the checklist—I'd best see what the good general wants," C. R. directed, his voice quivering slightly. Sgt Torque opened the crew entrance door and C. R. peered out. To his amazement, he saw the general, a covey of silver chickens and a crowd of reporters hovering about. He ducked back into the crew compartment. "Hey you guys, hurry up, looks like maybe we did something good!" And the World's Greatest Aviator stepped from the airplane. Applause greeted him along with the warm hand of the general.

"Congratulations, Major Terror— you and your crew have just flown the three millionth hour in the Starlifter."

C. R.'s chest puffed a little as he soaked up the praise and winked at the rest of his crew who had now joined him. "Yes, sir," boasted the Ace Aviator. "And thank you. It's dedicated professionals like us who daily cheat death and deliver the goods."

The men in green standing beside him all silently breathed a sigh of relief.

Everyone's doing it !

Writing Contest Rules

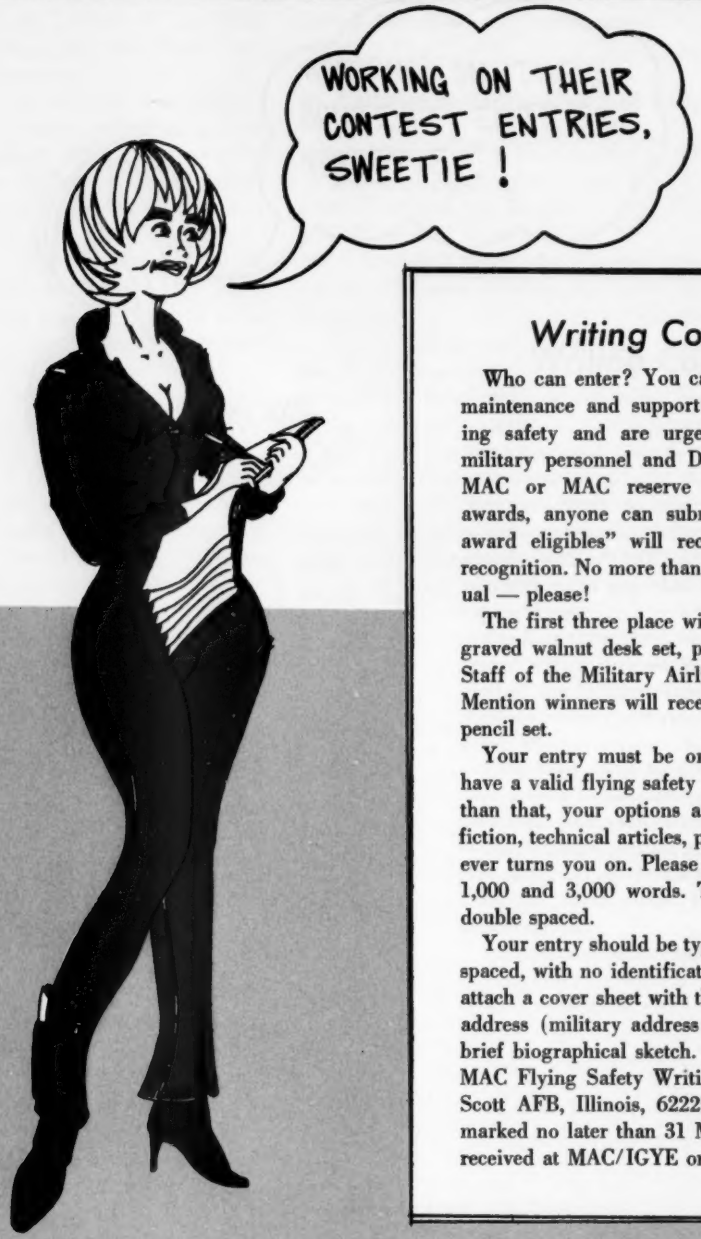
Who can enter? You can. All aircrew members, maintenance and support people are vital to flying safety and are urged to enter. While only military personnel and DAF civilians assigned to MAC or MAC reserve forces are eligible for awards, anyone can submit an entry. All "non-award eligibles" will receive appropriate special recognition. No more than three entries per individual — please!

The first three place winners will receive an engraved walnut desk set, presented by the Chief of Staff of the Military Airlift Command. Honorable Mention winners will receive a handsome pen and pencil set.

Your entry must be original, unpublished, and have a valid flying safety message for MAC. Other than that, your options are endless: fiction, non-fiction, technical articles, poetry, editorials — whatever turns you on. Please keep each entry between 1,000 and 3,000 words. That's about 6-14 pages, double spaced.

Your entry should be typed in two copies, double spaced, with no identification except the title. Then attach a cover sheet with the story title, your name, address (military address if you have one) and a brief biographical sketch. Mail your entry to: The MAC Flying Safety Writing Contest, MAC\IGYE, Scott AFB, Illinois, 62225. Entries must be postmarked no later than 31 March 1972, and must be received at MAC\IGYE on or before 7 April 1972.

Everyone's doing it !



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You Gotta be Tough to Fly the Heavies

Your son's first game in Little League
Begins at two today,
But you take off at three a.m.,
With tent pegs bound for Hue.

Your daughter has a concert, too —
She sure can play the flute —
But when the maestro waves his wand,
You park at Tan Son Nhut.

On Easter and on Mother's Day,
Your wife is all alone;
You're either up at snowy Goose,
Or stuck at Torrejon.

The only consolation is
That when it's time to die,
The devil will not find you, 'cause
You'll be on T - D - Y.

(Thanks to: Lt Col D. J. Driscoll, 6 MASq, McGuire)

Braking vs Breaking

Gentlemen, the subject for debate today is: "Can an aircraft be operated through a takeoff and landing sequence with the brakes locked?"

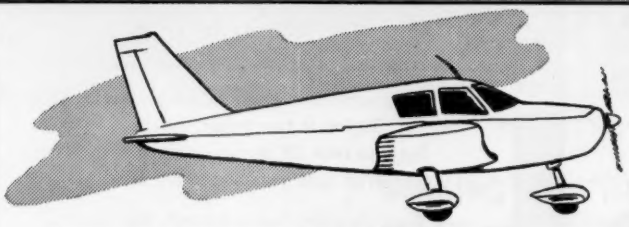
First, the gentlemen of the opposition: "No way," you say? Most of us might tend to agree, but let's listen to the affirmative team with their examples.

- The runway was snow-covered and the first pilot was making the takeoff from the right seat of a four-engine jet. As power was applied the aircraft started to move and the right-seater depressed the brake pedals to release the parking brakes. Though the brakes *did not* release (because he didn't push the pedals hard enough), the aircraft accelerated. Both pilots assumed the brakes were off. They discovered the error in flight and the brakes were released before descent, but during the landing some of the takeoff-balded tires failed, causing a few exciting moments on the runway.
- Same cockpit arrangement; patchy ice instead of snow on the runway. Right seater added power, depressed pedals, made takeoff. In flight the pilots noticed the parking brake knob in the on position, so the brake was released. The landing was made without using brakes but the tires were a loss due to scrubbing damage.
- Two other cases, reported in a past issue of THE MAC FLYER (March 1971) were very similar. In one, the aircraft flew a complete mission with the brakes on and suffered only tire damage. In the other, the result was a fatal departure-end crash.

In summary, the affirmative team states: "The coefficient of friction on an icy runway after aircraft movement starts is very nearly the same as the normal rolling friction of free-turning wheels on dry pavement. No pilot can be expected to detect the difference in takeoff performance between a smoothly *sliding* aircraft and one that is smoothly *rolling*."

Gentlemen of the opposition, have you anything further to add?

A Little Make-Believe



Suppose you own your own airplane — lock, stock, barrel, and maintenance. And suppose that the man who made the airplane writes to you once a month, telling you how nice his product is but mentioning things which just possibly might be worth keeping your eye on. Maybe he even suggests that one part of your airplane is aging faster than he had planned, and you'd best replace the weak unit with a stronger one — just as soon as you can afford it.

Now, when can you afford the new part? "By golly," you might reply, "I can afford it before I tear up my own airplane." But the odds are very strong that you'll have to have an accident — or a good scare —before the price finally looks right.

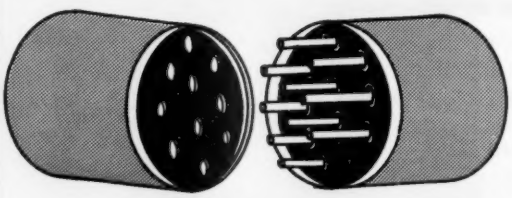
One of the MAC birds was in a similar situation, and the vendor advised us about a year ago that a problem was in the offing. We gave it the "read and initial" treatment; we hadn't had any trouble, though other same-bird users had. Now, we've had our first close scrape — minimized by some great pilotage — and we're buying the new parts. Makes you wonder, doesn't it?

Nomex Save

While the controversy continues to swirl about the static electricity problem with Nomex flight coveralls, the basic success of the fabric for fire resistant clothing is being proved. Case in point:

During a helicopter mission involving a pilot and several passengers, the whirly bird went able sugar and the pilot did the best he could to get the machinery safely on the ground. The aircraft refused to respond to his attempt to autorotate, and hit in a nose-up right bank from a vertical descent. The bird broke in half and the passengers died in the ensuing fire. The pilot? He was hospitalized, but . . . "It is significant to note that the pilot received no burns where he was protected by the Nomex flying coverall even though he was exposed to heat in excess of 243 degrees centigrade."

Grope and Hope Method



Attention, all you time savers — and that should include just about everyone, because all of us look for ways to save time.

Recently, a C-141 on an overwater flight had a spoiler unlocked indication. The pilot reset the spoilers, but the unlocked indication remained. Emergency retract did not affect the indication either. About an hour later, the problem mysteriously went away and the spoilers indicated locked.

Careful examination after landing revealed the cannon plug connecting the spoiler pack to the switch box did not mate properly. Actually, the male portion of the plug was pushed into the rubber insulation of the female plug. Arcing due to the misalignment caused the erroneous spoiler indications.

The question arises — How did the plug get this way? Apparently to save time someone lowered the flaps and performed maintenance on the spoiler packs in the blind. The proper procedure is to remove the landing light panel for access to the spoiler pack.

The moral here is anytime you perform maintenance, do it according to the T.O. If you have a better way of doing it, then submit the change through the proper channels for a change to the T.O. and let everyone in on the time saver.

FSO Item

When a military jet and a civilian light plane collided some time ago, the investigators went through the complete drill on cause factors, corrective actions, and "brief all pilots." Then the friendly FSO got in the act and decided that "all pilots" should include the "opposition" — the light plane drivers who have as much right to most airspace as their blue-suited counterparts. So, said FSO developed some visual materials — like local posters — and distributed copies to all the civilian facilities in the area. The posters displayed the locations of the military field and the civil patch, and highlighted the areas of probable conflicting traffic. The light plane fliers welcomed this since it included their point of view.

Does the idea suggest anything for your home drome? Exercise a little imagination and initiative — we're all in the flying fraternity together.

Is This Anyway to Run an Airline?

Reliable sources claim that the following announcement was recently heard at Love Field:

"Ladies and Gentlemen, Flight 641, which was originally scheduled for departure at 2:05, then cancelled, then rescheduled for 3:05, then moved from Gate 56 to Gate 54, then rescheduled for 3:15, will depart sometime today but not for the destinations originally scheduled. The airplane has arrived, and we think it is the one a little bit to your right.

"As you can see on the electronic televised computer, the flight is still scheduled to depart at 3:15, but as the time is now 3:27, it seems that the 3:15 departure has been postponed . . . "

(From THE FLIGHT DECK, American Airlines)

Sounds almost like ACP sometimes, doesn't it?

"Is the gear still down?"

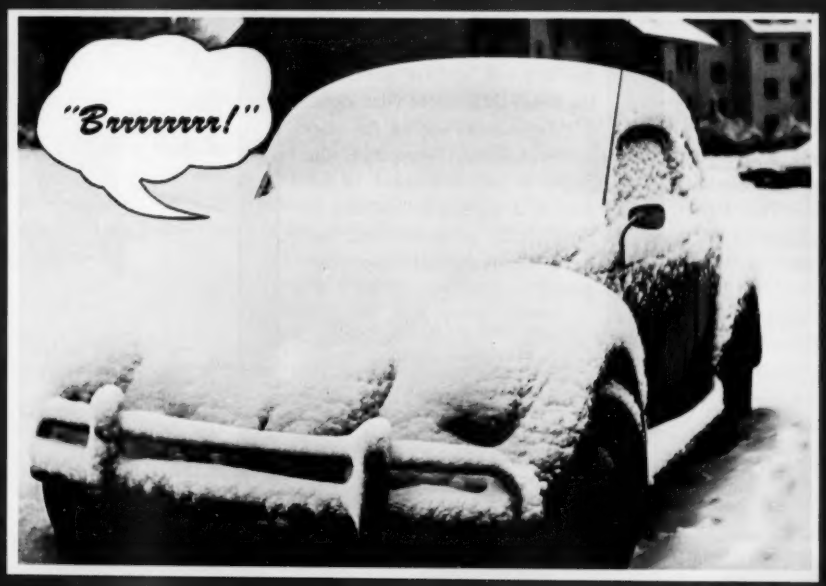
"Yeah, six inches below the runway."

Takeoff on a Turnpike?

As a large jet airliner thundered down the runway on takeoff, the pilots suddenly saw an *automobile on the runway*— headed directly toward them! Fortunately, the aircraft was going fast enough to "leap frog" over the vehicle, continue the takeoff, and get airborne. Safely off the ground, the aircrew promptly notified the control tower operator of their problem. The automobile was quickly cornered by the airport's patrol who discovered that it was being driven by an elderly gentleman who was "disoriented." He wasn't even aware that he was on an airport!

(From Flight Safety Foundation)

the ANALYZER



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